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Abstract

# RESONANCE ABSORPTION IN HTGR-FUEL ELEMENTS CONTAINING FERTILE AND FISSILE MATERIAL AS COATED PARTICLES IMBEDDED IN A GRAPHITE MATRIX

K. Donat
Institut für Reaktorentwicklung
Österreichische Studiengesellschaft für Atomenergie Ges.m.b.h.

In most HTGR cores the fuel elements contain fertile and fissile material as carbide particles, coated with pyrolytic carbon and imbedded in a graphite matrix of particular shape. The distribution of fertile and fissile material in the fuel elements and in the core affects the most important core parameters, such as resonance capture and conversion ratio.

The most accurate analytical method to date of calculating resonance capture is the direct numerical solution of the integral equation for the mean flux in the absorber.

L.W. Nordheim has developed a method for treating the grain structure of fuel elements taking into account the macroscopic heterogeneities. The basic idea is to take the grains themselves as the fundamental elements. Following this way, it is investigated in detail how the different distributions in the core of fertile and fissile materials can be treated with this method and how they affect the basic core parameters.